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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/614,374	07/12/2000	GOSUKE OSHIMA	TY-001	2254

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EXAMINER
VIGUSHIN, JOHN B

ART UNIT	PAPER NUMBER
2827	5

DATE MAILED: 03/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/614,374	OSHIMA ET AL.	
	Examiner	Art Unit	
	John B. Vigushin	2827	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 February 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) *1-13 and 22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☒ Claim(s) *15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 July 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group II, Claims 14-21 in Paper No. 4 (filed February 26, 2002; Certificate of Mailing date: February 21, 2002) is acknowledged.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 21 recites the limitation "said at least one layer" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Rejections Based On Prior Art

4. The following references were relied upon for the rejections hereinbelow:

Harada et al. (US 5,966,294)

Horiba et al. (US 5,822,194)

Yoshizumi et al. (US 5,043,211)

Kazle (US 5,847,930)

Ichihara (US 5,455,384)

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 14, 16-18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Kazle. Examiner's Note: In the rejection of Claim 20, below, the Examiner discloses an inherent property of epoxy resins used in Kazle. Since Kazle is silent as to said inherent property, another reference, Yoshizumi et al., was used as **evidence** for the assertion of inherency in Kazle. Thus, two references were relied upon for the 35 USC § 102(b) rejection in accordance with the practice of multiple reference 35 USC § 102 rejections set forth in MPEP § 2131.01 (see introductory paragraph and section III).

A) As to Claim 14, Kazle discloses a substrate 11 having a main surface (Fig. 1), electronic parts 20, 22, 24, 26 mounted on the main surface of substrate 11 (Figs. 2A,B; col.4: 5-10 and 29-31), a resin part 85 formed on the main surface of substrate 11 so that resin part 85 fills a specified space surrounding the

electronic parts 20, 22, 24 and 26 (Figs. 1, 2A, 2B; col.4: 5-10; col.5: 44-52), and terminal electrodes 51a,b, 52a,b, 53a,b, 71a,b that are exposed to the outside (col.4: 11-17).

B) As to Claim 16, Kazle further discloses substrate 11 having the shape of a rectangular solid of a specified thickness (Fig. 1; col.3: 67-col.4: 3).

C) As to Claim 17, Kazle further discloses the resin part 85 having the shape of a rectangular solid (Fig. 1; col.3: 67-col.4: 3) formed to a specified thickness over the entire main surface of substrate 11 (Figs. 1, 5 and 6; col.5: 44-52); the side surfaces of resin part 85 are positioned in the same planes as the side surfaces of substrate 11 (Fig. 1).

D) As to Claim 18, Kazle further discloses the resin part 85 having the shape of a rectangular solid (Fig. 1; col.3: 67-col.4: 3) formed over the entire main surface of substrate 11 (Figs. 1, 5 and 6; col.5: 44-52); terminal electrodes 51a,b, 52a,b, 53a,b, 71a,b embedded in resin part 85 (col.4: 11-17); end surfaces of terminal electrodes 51a,b, 52a,b, 53a,b, 71a,b are exposed in the same plane as the side surfaces of the resin part 85 and the surface of the resin part 85 that is parallel to the main surface of substrate 11 (Fig. 1; col.4: 14-17).

E) As to Claim 20, Kazle (col.5: 44-54) further discloses that the resin part 85 is an epoxy and Yoshizumi et al. (col.1: 10-20) discloses that ***epoxy resins*** are widely used for encapsulating electronic devices and ***inherently*** possess excellent waterproofing properties.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kazle in view of Horiba et al. and Harada et al.

I. Kazle discloses all the limitations of the claim, including that the resin part 85 consists of an epoxy resin (col.5: 44-54), but does not teach that the epoxy resin part 85 consists of at least one of a ferrite filler or a metal filler dispersed therein.

II. Horiba et al. discloses a substrate 1 with electronic parts mounted on a main surface and an epoxy resin encapsulant 3 having a filler of ferrite particles dispersed therein; and Harada et al. discloses that ferrite filler dispersed in epoxy resin material inherently exhibits magnetic loss at high frequencies which enables the epoxy resin with ferrite filler to attenuate high frequency noise, i.e., electromagnetic interference (EMI) and thereby prevent malfunction of the circuit components due to EMI (col.17: 13-20; col.18: 16-22 and 38-42).

III. Since Kazle and Horiba et al. both have epoxy resin parts that encapsulate the electronic components on the main surface of a substrate, the ferrite filled epoxy resin part of Horiba et al. (having the inherent EMI reducing properties, as taught by Harada et al.) for use as EMI protection, as well as mechanical

protection, of the encapsulated circuit would have been readily recognized in the pertinent art of Kazle for applications in electronic environments wherein high frequency noise threatens to cause the electronic parts on the main surface of the circuit substrate to malfunction.

IV. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the epoxy resin part of Kazle with the ferrite filler, as taught by Horiba et al., in order to take advantage of the noise-suppressing properties of epoxy resins with ferrite filler, as taught by Harada et al., thereby protecting the electronic components on the circuit substrate in Kazle from environmental EMI, hence, ensuring the proper functioning of the circuit.

9. Claim 21 (as best understood by the Examiner in view of the 35 USC § 112, 2nd paragraph rejection in section 3, above) is rejected under 35 U.S.C. 103(a) as being unpatentable over Kazle in view of Ichihara.

I. Kazle discloses all the limitations of base Claim 14 including: a substrate 12 having a main surface (Fig. 8), electronic parts 20, 22, 24, 26 mounted on the main surface of substrate 12 (col.6: 14-20; Figs. 2A,B; col.4: 5-10 and 29-31), a resin part 85 formed on the main surface of substrate 12 so that resin part 85 fills a specified space surrounding the electronic parts 20, 22, 24 and 26 (Figs. 8, 2A, 2B; col.7: 8-12), and terminal electrodes 151a,b, 152a,b, 153a,b, 171a,b that are exposed to the outside (Fig. 8; col.6: 20-29). The resultant module of Kazle (Fig. 8) is designed to be mounted on a motherboard (col.4: 14-20).

II. Kazle does not teach at least one layer selected of an electromagnetic field shielding layer, a heat-dissipating layer or a metal layer formed in a specified region on the surface of resin part 85.

III. Ichihara discloses a substrate 10 having electronic parts 12a,b,c,d mounted thereon and a resin part 14 encapsulating substrate 10 and the electronic parts 12a,b,c,d (Figs. 1 and 2; col.2: 60-66) and further discloses a metal layer 16 formed on the surface of the resin part 14, except for small portions of the resin part surrounding the terminals 17a-h left unmetallized (Fig. 4; col.3: 4-14), for the purpose of providing an EMI shield to cover and protect the circuit substrate 10 when the module (Fig. 4) is mounted to a motherboard and the metal layer 16 is grounded to a ground pattern of the motherboard (col.3: 20-32).

IV. Since Kazle and Ichihara both disclose modules comprising a resin part that encapsulates a circuit substrate with edge terminals for mounting to a motherboard, then the metal layer deposited on the resin part and grounded to the ground pattern of a motherboard for use in EMI shielding of the circuit substrate, as taught by Ichihara, would have been readily recognized in the pertinent art of Kazle as EMI protection for the encapsulated circuit on the substrate, thus ensuring the functional reliability of the circuit.

V. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the module of Kazle (Fig. 8) by depositing a metal layer on the resin part 85 of the module, leaving small portions of the resin part surrounding the terminals 151a,b, 152a,b, 153a,b, 171a,b unmetallized

as in Ichihara, in order to provide EMI shielding, as taught by Ichihara, for the circuit substrate and the electronic parts thereon in the module of Kazle.

Allowable Subject Matter

10. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

As to Claim 15, patentability resides in *an intermediate layer consisting of an insulating elastic material formed on the main surface of the substrate so that the intermediate layer fills a specified space surrounding the electronic parts*, in combination with the other limitations of the claim.

12. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Takagi et al. (US 5,631,809) discloses a module 10 comprising chip 13 mounted on a lead frame, encapsulated by a resin 15 (col.8: 55-59), said module 10 surface mounted through leads 12 to circuit board 16 (Fig. 16; col.9: 27-34).

b) Kikuchi et al. (US 5,122,860) discloses, in Fig. 12, a module comprising a circuit substrate 31A having a main surface, components 35 mounted on the main surface of substrate 31A, an epoxy resin part 38 (col.2: 3-5) formed on the main surface of substrate 31A, and terminals (lands 32) exposed on the surface of substrate 31A opposite the main surface for external connection.

c) Tuttle et al. (US 5,612,513) discloses, in Figs. 2 and 8, a module comprising a substrate 132 having components 136, 138 mounted on the main surface, an epoxy resin part formed on a specified region of the main surface and leads 144 forming an edge connector on the exposed (unencapsulated) portion of the main surface of substrate 132.

d) Mattei et al. (US 5,694,300) discloses a circuit substrate 10 with components mounted on specified regions of the substrate 10, epoxy resin parts formed on said specified regions, thereby encapsulating the components, and a metal layer deposited on the resin parts 26 and 27 (Fig. 2; col.2: 26-35) for EMI protection (col.1: 58-61).

e) Kubota et al. (US 5,635,669) discloses a ceramic multilayer substrate 11 having external connection terminals 12 on the side surfaces of substrate 11 (Figs. 1-4) and electronic components 46 mounted on the main surface of the laminate substrate 11 (Fig. 13; col.10: 16-21).

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B. Vigushin whose telephone number is 703-308-1205. The examiner can normally be reached on John Vigushin from 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott, can be reached on (703) 305-9883. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

John B. Vigushin
Examiner
Art Unit 2827

jbv

March 08, 2002